

Highlighting High Performance Design Leaders in Colorado Schools

Apr 20th, 2004 Westminster

Linda Smith, Sr. Program Manager

Joan Gregerson, Consultant

***Governor's Office of Energy Management and
Conservation***

www.colorado.gov/rebuildco



Thank you sponsors!

- **AIA Denver Committee on the Environment**
- **Council of Educational Facility Planners International (CEFPI)**
- **US Green Building Council - Colorado Chapter**
- **Tri-State Generation & Transmission**
- **Enlink Geoenergy**
- **US Department of Energy – Rebuild America**



Rebuild Colorado

Helping
get better buildings
through energy and water
efficiency improvements



Rebuild Colorado Team

Rebuild Colorado, OEMC
Linda Smith, Sr. Project Manager



Network of private sector experts:

- Energy engineers
- Energy managers
- High performance design experts
- Performance contracting experts

In partnership with:
DOE's Rebuild America



EPA's Energy Star Buildings



Free Services for:

- School districts
- Cities
- Counties
- State agencies
- Higher education
- Public hospitals
- Housing authorities

Free services

We can help with:

- energy performance contracting
- high performance design
- commissioning
- energy management for small school districts

Not sure which services you need?
Call us...we'll help figure it out!
303-894-2383 x1203



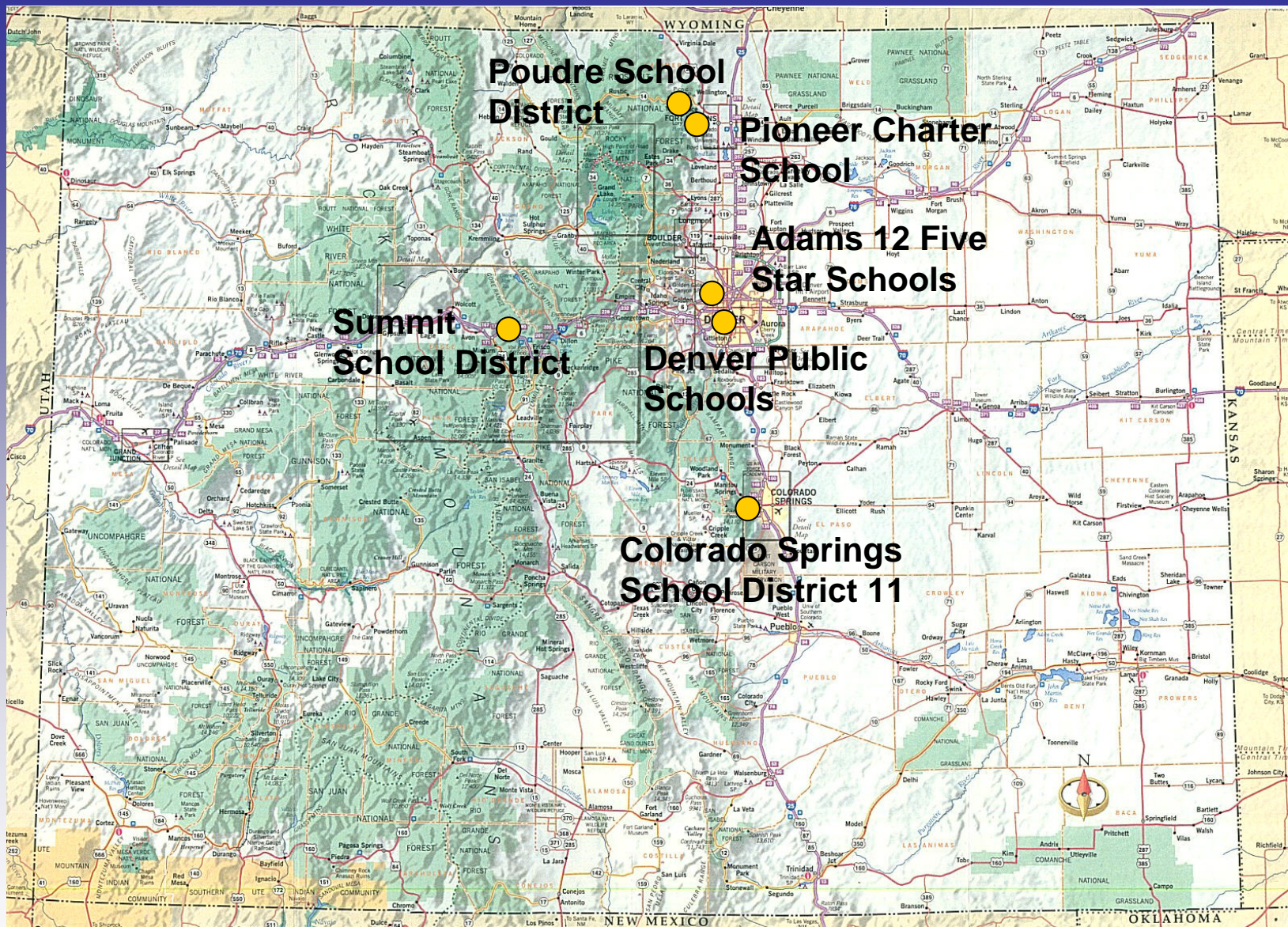
High Performance Design

Our free services:

- Grants for demonstration projects using LEED
- Online case studies, helpful documents
- Workshops: high performance design, LEED



High Performance Design Leaders in Colorado Schools



Colorado Springs School District 11

Lessons learned:

- Use integrated design, not “architect down”
- Use energy modeling
- Use commissioning
- Use life-cycle rather than first cost for decisions
- Set energy & water performance targets
- Consider environmental impacts of materials

The efficiency of schools built in late 1990's was disappointing.

What went wrong?

What do we need to do differently?

Colorado Springs School District 11

Achievements:

- Sustainable Design Guidelines
- RFQ for Architects & Engineers
- Model Contract for Architects & Engineers

Setting the groundwork for
future bond programs

Poudre School District

Fort Collins



Poudre School District: Zach and Bacon Elementary

- Construction costs: \$100 per square foot
- Paid higher design fees: 2% of construction costs
- Energy costs: \$0.43 per square (same as best school in district without AC)

Poudre School District: Fossil Ridge High School

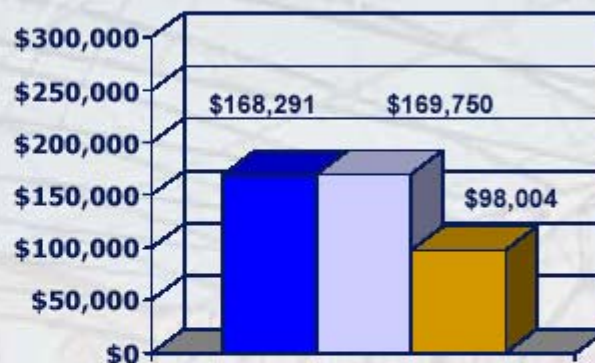
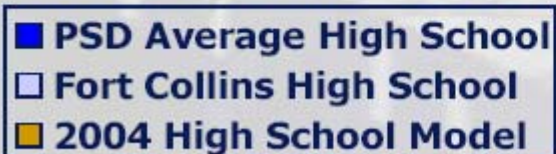


Poudre School District

High School Energy Model



Cost per SF



Utility Cost per year

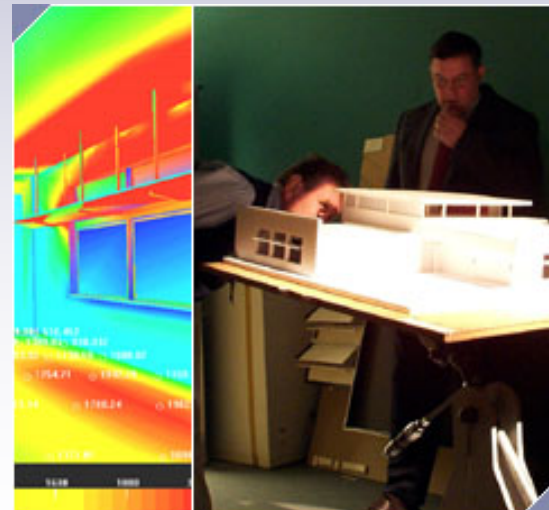
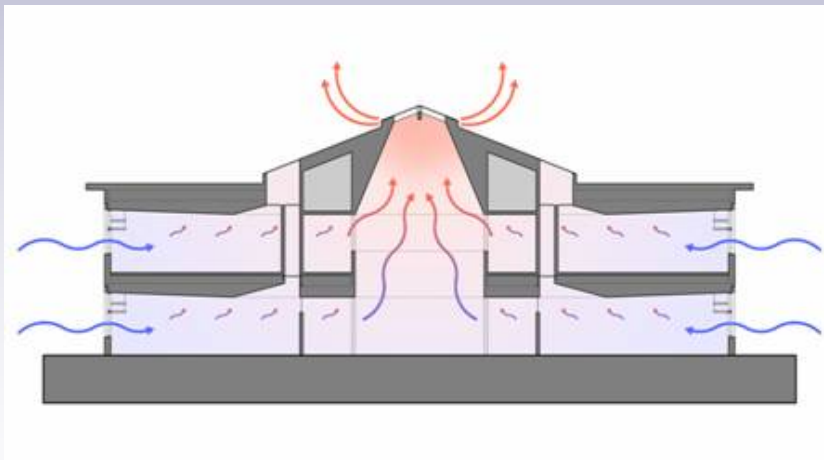


\$70,000 annual savings over the average PSD High School

Summit School District

Silverthorne Elementary

“No electrical lighting should be needed in classrooms during the day”

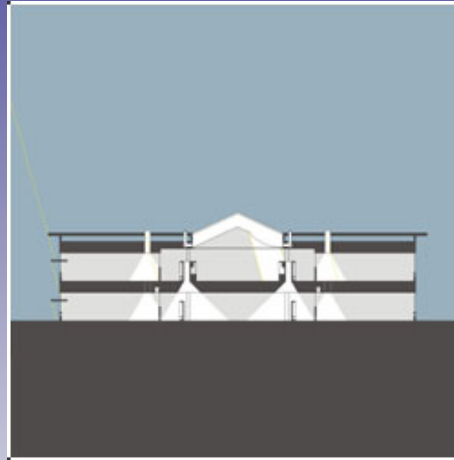


Silverthorne Elementary



Silverthorne Elementary

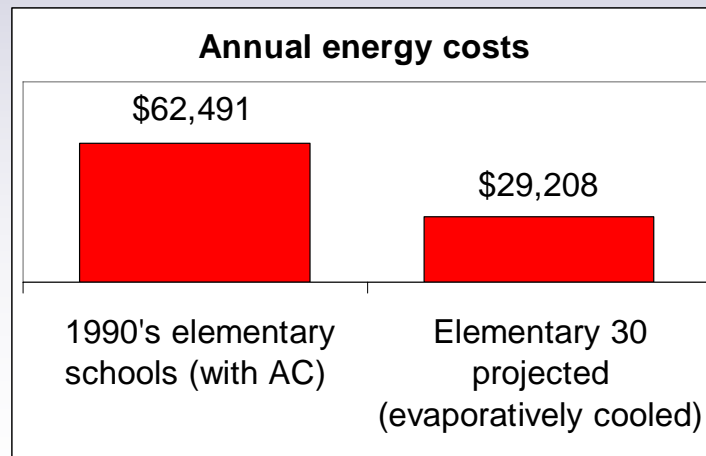
Skylights and shafts deliver natural light throughout the school...



Adams 12 School District: Kids First!

“We focus on what's best for kids, and the result is a design that fits our budget and yields lower operating costs for decades to come.”

- David Besel



Denver Public Schools Stapleton II K-8



- Commitment to Sustainable Design
- Geoexchange and preheat/precool system

Denver Public Schools Stapleton II K-8

Optimized daylighting:

- Miniature light shelves
- Adjusted ceiling height



Jefferson County Schools Falcon Bluffs Middle School

- Opened 2003
- 121,000 square feet
- 700 student capacity



Jefferson County Schools Falcon Bluffs Middle School

- Thermal ice storage
- Hydronic 2-pipe design saves on first cost
- Daylighting
- Owner performed commissioning



Thermal storage tanks

Pioneer Charter School for Expeditionary Learning

***“...the coolest Public
School in fort Collins”***

**\$105 per square
foot**

**Part of the
Expeditionary
Learning and
Outward Bound
Program**



Pioneer Charter School for Expeditionary Learning



LEED™ Registered
www.usgbc.org/leed



- Structurally insulated panels for main structure
- Insulated concrete forms for commons
- Operable windows
- Hydronic in-floor heating

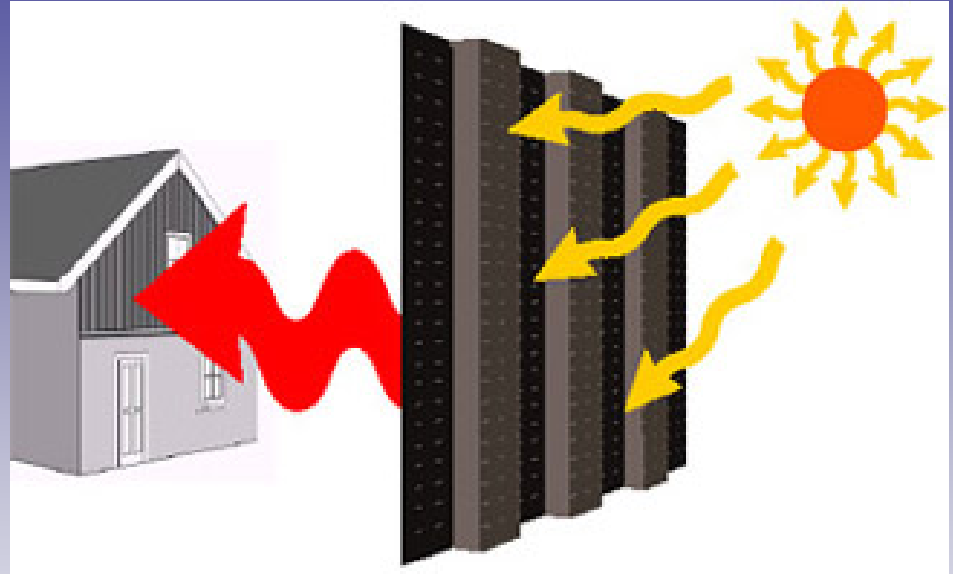
Durango Public Schools

- New High School
- Completion November 2004
- Low VOC paint



Durango Public Schools

- Transpired air collectors for preheating, precooling



South face – auxiliary gym

Lesson learned

You can build better schools within typical budgets....

But you have to go about it differently

The cost?

- More in design fees (add 2% over norm)
- Same or less in construction costs
- Much less in operating costs...half the energy costs of other new schools built in Colorado today

High performance schools ...

- Use integrated design
- Use energy modeling
- Use commissioning
- Use life-cycle rather than first cost for decisions
- Consider environmental impacts of materials
- Set energy & water performance targets

EnergyStar Schools

LEED Certification

Beat best school in district

Beat ASHRAE Std 90.1-99 by 60%

How can we encourage more high performance design successes?

Need a system...

US Green Building Council LEED™ Rating System

- Voluntary consensus-based system
- Checklist approach
- Encourages integrated design and inclusion of cost-effective energy efficiency and environmentally responsive features

www.usgbc.org/leed

US Green Building Council LEED™ Rating System

Framework for good design

Encourages project teams to:

- ✓ Use integrated design
- ✓ Use energy modeling
- ✓ Use commissioning
- ✓ Use life-cycle rather than first cost for decisions
- ✓ Set energy & water performance targets
- ✓ Consider environmental impacts of materials



Project Checklist

Sustainable Sites

14 Possible Points

<input checked="" type="checkbox"/>	Prereq 1	Erosion & Sedimentation Control	Required
<input checked="" type="checkbox"/>	Credit 1	Site Selection	1
<input checked="" type="checkbox"/>	Credit 2	Urban Redevelopment	1
<input checked="" type="checkbox"/>	Credit 3	Brownfield Redevelopment	1
<input checked="" type="checkbox"/>	Credit 4.1	Alternative Transportation , Public Transportation Access	1
<input checked="" type="checkbox"/>	Credit 4.2	Alternative Transportation , Bicycle Storage & Changing Rooms	1
<input checked="" type="checkbox"/>	Credit 4.3	Alternative Transportation , Alternative Fuel Vehicles	1
<input checked="" type="checkbox"/>	Credit 4.4	Alternative Transportation , Parking Capacity	1
<input checked="" type="checkbox"/>	Credit 5.1	Reduced Site Disturbance , Protect or Restore Open Space	1
<input checked="" type="checkbox"/>	Credit 5.2	Reduced Site Disturbance , Development Footprint	1
<input checked="" type="checkbox"/>	Credit 6.1	Stormwater Management , Rate and Quantity	1
<input checked="" type="checkbox"/>	Credit 6.2	Stormwater Management , Treatment	1
<input checked="" type="checkbox"/>	Credit 7.1	Heat Island Effect , Non-Roof	1
<input checked="" type="checkbox"/>	Credit 7.2	Heat Island Effect , Roof	1
<input checked="" type="checkbox"/>	Credit 8	Light Pollution Reduction	1

Water Efficiency

5 Possible Points

<input checked="" type="checkbox"/>	Credit 1.1	Water Efficient Landscaping , Reduce by 50%	1
<input checked="" type="checkbox"/>	Credit 1.2	Water Efficient Landscaping , No Potable Use or No Irrigation	1
<input checked="" type="checkbox"/>	Credit 2	Innovative Wastewater Technologies	1
<input checked="" type="checkbox"/>	Credit 3.1	Water Use Reduction , 20% Reduction	1
<input checked="" type="checkbox"/>	Credit 3.2	Water Use Reduction , 30% Reduction	1

Energy & Atmosphere

17 Possible Points

<input checked="" type="checkbox"/>	Prereq 1	Fundamental Building Systems Commissioning	Required
<input checked="" type="checkbox"/>	Prereq 2	Minimum Energy Performance	Required
<input checked="" type="checkbox"/>	Prereq 3	CFC Reduction in HVAC&R Equipment	Required
<input checked="" type="checkbox"/>	Credit 1	Optimize Energy Performance	1-10
<input checked="" type="checkbox"/>	Credit 2.1	Renewable Energy , 5%	1
<input checked="" type="checkbox"/>	Credit 2.2	Renewable Energy , 10%	1
<input checked="" type="checkbox"/>	Credit 2.3	Renewable Energy , 20%	1
<input checked="" type="checkbox"/>	Credit 3	Additional Commissioning	1
<input checked="" type="checkbox"/>	Credit 4	Ozone Depletion	1
<input checked="" type="checkbox"/>	Credit 5	Measurement & Verification	1
<input checked="" type="checkbox"/>	Credit 6	Green Power	1

LEED™ Rating System Version 2.1



J.S. Green Building Council

Checklist



Materials & Resources

13 Possible Points

<input checked="" type="checkbox"/>	Prereq 1	Storage & Collection of Recyclables	Required
<input checked="" type="checkbox"/>	Credit 1.1	Building Reuse , Maintain 75% of Existing Shell	1
<input checked="" type="checkbox"/>	Credit 1.2	Building Reuse , Maintain 100% of Shell	1
<input checked="" type="checkbox"/>	Credit 1.3	Building Reuse , Maintain 100% Shell & 50% Non-Shell	1
<input checked="" type="checkbox"/>	Credit 2.1	Construction Waste Management , Divert 50%	1
<input checked="" type="checkbox"/>	Credit 2.2	Construction Waste Management , Divert 75%	1
<input checked="" type="checkbox"/>	Credit 3.1	Resource Reuse , Specify 5%	1
<input checked="" type="checkbox"/>	Credit 3.2	Resource Reuse , Specify 10%	1
<input checked="" type="checkbox"/>	Credit 4.1	Recycled Content , Specify 5% (p.c. + 1/2 p.i.)	1
<input checked="" type="checkbox"/>	Credit 4.2	Recycled Content , Specify 10% (p.c. + 1/2 p.i.)	1
<input checked="" type="checkbox"/>	Credit 5.1	Local/Regional Materials , 20% Manufactured Locally	1
<input checked="" type="checkbox"/>	Credit 5.2	Local/Regional Materials , of 20% in MRc5.1, 50% Harvested Locally	1
<input checked="" type="checkbox"/>	Credit 6	Rapidly Renewable Materials	1
<input checked="" type="checkbox"/>	Credit 7	Certified Wood	1

Indoor Environmental Quality

15 Possible Points

<input checked="" type="checkbox"/>	Prereq 1	Minimum IAQ Performance	Required
<input checked="" type="checkbox"/>	Prereq 2	Environmental Tobacco Smoke (ETS) Control	Required
<input checked="" type="checkbox"/>	Credit 1	Carbon Dioxide (CO₂) Monitoring	1
<input checked="" type="checkbox"/>	Credit 2	Ventilation Effectiveness	1
<input checked="" type="checkbox"/>	Credit 3.1	Construction IAQ Management Plan , During Construction	1
<input checked="" type="checkbox"/>	Credit 3.2	Construction IAQ Management Plan , Before Occupancy	1
<input checked="" type="checkbox"/>	Credit 4.1	Low-Emitting Materials , Adhesives & Sealants	1
<input checked="" type="checkbox"/>	Credit 4.2	Low-Emitting Materials , Paints	1
<input checked="" type="checkbox"/>	Credit 4.3	Low-Emitting Materials , Carpet	1
<input checked="" type="checkbox"/>	Credit 4.4	Low-Emitting Materials , Composite Wood	1
<input checked="" type="checkbox"/>	Credit 5	Indoor Chemical & Pollutant Source Control	1
<input checked="" type="checkbox"/>	Credit 6.1	Controllability of Systems , Perimeter	1
<input checked="" type="checkbox"/>	Credit 6.2	Controllability of Systems , Non-Perimeter	1
<input checked="" type="checkbox"/>	Credit 7.1	Thermal Comfort , Comply with ASHRAE 55-1992	1
<input checked="" type="checkbox"/>	Credit 7.2	Thermal Comfort , Permanent Monitoring System	1
<input checked="" type="checkbox"/>	Credit 8.1	Daylight & Views , Daylight 75% of Spaces	1
<input checked="" type="checkbox"/>	Credit 8.2	Daylight & Views , Views for 90% of Spaces	1

Innovation & Design Process

5 Possible Points

<input checked="" type="checkbox"/>	Credit 1.1	Innovation in Design	1
<input checked="" type="checkbox"/>	Credit 1.2	Innovation in Design	1
<input checked="" type="checkbox"/>	Credit 1.3	Innovation in Design	1
<input checked="" type="checkbox"/>	Credit 1.4	Innovation in Design	1
<input checked="" type="checkbox"/>	Credit 2	LEED™ Accredited Professional	1

Project Totals

69 Possible Points

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Certified 26-32 points	Silver 33-38 points	Gold 39-51 points	Platinum 52-69 points
--------------------------	--------------------------	--------------------------	------------------------	---------------------	-------------------	-----------------------





Project Checklist

Sustainable Sites

14 Possible Points

Y	Prereq 1	Erosion & Sedimentation Control	Required
<input type="checkbox"/>	<input type="checkbox"/>	Credit 1 Site Selection	1
<input type="checkbox"/>	<input type="checkbox"/>	Credit 2 Urban Redevelopment	1
<input type="checkbox"/>	<input type="checkbox"/>	Credit 3 Brownfield Redevelopment	1
<input type="checkbox"/>	<input type="checkbox"/>	Credit 4.1 Alternative Transportation, Public Transportation Access	1
<input type="checkbox"/>	<input type="checkbox"/>	Credit 4.2 Alternative Transportation, Bicycle Storage & Changing Rooms	1
<input type="checkbox"/>	<input type="checkbox"/>	Credit 4.3 Alternative Transportation, Alternative Fuel Vehicles	1
<input type="checkbox"/>	<input type="checkbox"/>	Credit 4.4 Alternative Transportation, Parking Capacity	1
<input type="checkbox"/>	<input type="checkbox"/>	Credit 5.1 Reduced Site Disturbance, Protect or Restore Open Space	1
<input type="checkbox"/>	<input type="checkbox"/>	Credit 5.2 Reduced Site Disturbance, Development Footprint	1
<input type="checkbox"/>	<input type="checkbox"/>	Credit 6.1 Stormwater Management, Rate and Quantity	1
<input type="checkbox"/>	<input type="checkbox"/>	Credit 6.2 Stormwater Management, Treatment	1
<input type="checkbox"/>	<input type="checkbox"/>	Credit 7.1 Heat Island Effect, Non-Roof	1
<input type="checkbox"/>	<input type="checkbox"/>	Credit 7.2 Heat Island Effect, Roof	1
<input type="checkbox"/>	<input type="checkbox"/>	Credit 8 Light Pollution Reduction	1

Water Efficiency

5 Possible Points

<input type="checkbox"/>	<input type="checkbox"/>	Credit 1.1 Water Efficient Landscaping, Reduce by 50%	1
<input type="checkbox"/>	<input type="checkbox"/>	Credit 1.2 Water Efficient Landscaping, No Potable Use or No Irrigation	1
<input type="checkbox"/>	<input type="checkbox"/>	Credit 2 Innovative Wastewater Technologies	1
<input type="checkbox"/>	<input type="checkbox"/>	Credit 3.1 Water Use Reduction, 20% Reduction	1
<input type="checkbox"/>	<input type="checkbox"/>	Credit 3.2 Water Use Reduction, 30% Reduction	1

Energy & Atmosphere

17 Possible Points

Y	Prereq 1	Fundamental Building Systems Commissioning	Required
Y	Prereq 2	Minimum Energy Performance	Required
Y	Prereq 3	CFC Reduction in HVAC&R Equipment	Required
<input type="checkbox"/>	<input type="checkbox"/>	Credit 1 Optimize Energy Performance	1-10
<input type="checkbox"/>	<input type="checkbox"/>	Credit 2.1 Renewable Energy, 5%	1
<input type="checkbox"/>	<input type="checkbox"/>	Credit 2.2 Renewable Energy, 10%	1
<input type="checkbox"/>	<input type="checkbox"/>	Credit 2.3 Renewable Energy, 20%	1
<input type="checkbox"/>	<input type="checkbox"/>	Credit 3 Additional Commissioning	1
<input type="checkbox"/>	<input type="checkbox"/>	Credit 4 Ozone Depletion	1
<input type="checkbox"/>	<input type="checkbox"/>	Credit 5 Measurement & Verification	1
<input type="checkbox"/>	<input type="checkbox"/>	Credit 6 Green Power	1

LEED™ Rating System Version 2.1



U.S. Green Building Council

Prerequisites



Materials & Resources

13 Possible Points

Y	Prereq 1	Storage & Collection of Recyclables	Required
<input type="checkbox"/>	<input type="checkbox"/>	Credit 1.1 Building Reuse, Maintain 75% of Existing Shell	1
<input type="checkbox"/>	<input type="checkbox"/>	Credit 1.2 Building Reuse, Maintain 100% of Shell	1
<input type="checkbox"/>	<input type="checkbox"/>	Credit 1.3 Building Reuse, Maintain 100% Shell & 50% Non-Shell	1
<input type="checkbox"/>	<input type="checkbox"/>	Credit 2.1 Construction Waste Management, Divert 50%	1
<input type="checkbox"/>	<input type="checkbox"/>	Credit 2.2 Construction Waste Management, Divert 75%	1
<input type="checkbox"/>	<input type="checkbox"/>	Credit 3.1 Resource Reuse, Specify 5%	1
<input type="checkbox"/>	<input type="checkbox"/>	Credit 3.2 Resource Reuse, Specify 10%	1
<input type="checkbox"/>	<input type="checkbox"/>	Credit 4.1 Recycled Content, Specify 5% (p.c. + 1/2 p.i.)	1
<input type="checkbox"/>	<input type="checkbox"/>	Credit 4.2 Recycled Content, Specify 10% (p.c. + 1/2 p.i.)	1
<input type="checkbox"/>	<input type="checkbox"/>	Credit 5.1 Local/Regional Materials, 20% Manufactured Locally	1
<input type="checkbox"/>	<input type="checkbox"/>	Credit 5.2 Local/Regional Materials, of 20% in MRc5.1, 50% Harvested Locally	1
<input type="checkbox"/>	<input type="checkbox"/>	Credit 6 Rapidly Renewable Materials	1
<input type="checkbox"/>	<input type="checkbox"/>	Credit 7 Certified Wood	1

Indoor Environmental Quality

15 Possible Points

Y	Prereq 1	Minimum IAQ Performance	Required
Y	Prereq 2	Environmental Tobacco Smoke (ETS) Control	Required
<input type="checkbox"/>	<input type="checkbox"/>	Credit 1 Carbon Dioxide (CO ₂) Monitoring	1
<input type="checkbox"/>	<input type="checkbox"/>	Credit 2 Ventilation Effectiveness	1
<input type="checkbox"/>	<input type="checkbox"/>	Credit 3.1 Construction IAQ Management Plan, During Construction	1
<input type="checkbox"/>	<input type="checkbox"/>	Credit 3.2 Construction IAQ Management Plan, Before Occupancy	1
<input type="checkbox"/>	<input type="checkbox"/>	Credit 4.1 Low-Emitting Materials, Adhesives & Sealants	1
<input type="checkbox"/>	<input type="checkbox"/>	Credit 4.2 Low-Emitting Materials, Paints	1
<input type="checkbox"/>	<input type="checkbox"/>	Credit 4.3 Low-Emitting Materials, Carpet	1
<input type="checkbox"/>	<input type="checkbox"/>	Credit 4.4 Low-Emitting Materials, Composite Wood	1
<input type="checkbox"/>	<input type="checkbox"/>	Credit 5 Indoor Chemical & Pollutant Source Control	1
<input type="checkbox"/>	<input type="checkbox"/>	Credit 6.1 Controllability of Systems, Perimeter	1
<input type="checkbox"/>	<input type="checkbox"/>	Credit 6.2 Controllability of Systems, Non-Perimeter	1
<input type="checkbox"/>	<input type="checkbox"/>	Credit 7.1 Thermal Comfort, Comply with ASHRAE 55-1992	1
<input type="checkbox"/>	<input type="checkbox"/>	Credit 7.2 Thermal Comfort, Permanent Monitoring System	1
<input type="checkbox"/>	<input type="checkbox"/>	Credit 8.1 Daylight & Views, Daylight 75% of Spaces	1
<input type="checkbox"/>	<input type="checkbox"/>	Credit 8.2 Daylight & Views, Views for 90% of Spaces	1

Innovation & Design Process

5 Possible Points

<input type="checkbox"/>	<input type="checkbox"/>	Credit 1.1 Innovation in Design	1
<input type="checkbox"/>	<input type="checkbox"/>	Credit 1.2 Innovation in Design	1
<input type="checkbox"/>	<input type="checkbox"/>	Credit 1.3 Innovation in Design	1
<input type="checkbox"/>	<input type="checkbox"/>	Credit 1.4 Innovation in Design	1
<input type="checkbox"/>	<input type="checkbox"/>	Credit 2 LEED™ Accredited Professional	1

Project Totals

69 Possible Points

<input type="checkbox"/>	<input type="checkbox"/>	Certified 26-32 points	Silver 33-38 points	Gold 39-51 points	Platinum 52-69 points
--------------------------	--------------------------	------------------------	---------------------	-------------------	-----------------------





Project Checklist

Sustainable Sites

14 Possible Points

<input checked="" type="checkbox"/>	Prereq 1	Erosion & Sedimentation Control	Required
<input checked="" type="checkbox"/>	Credit 1	Site Selection	1
<input checked="" type="checkbox"/>	Credit 2	Urban Redevelopment	1
<input checked="" type="checkbox"/>	Credit 3	Brownfield Redevelopment	1
<input checked="" type="checkbox"/>	Credit 4.1	Alternative Transportation, Public Transportation Access	1
<input checked="" type="checkbox"/>	Credit 4.2	Alternative Transportation, Bicycle Storage & Changing Rooms	1
<input checked="" type="checkbox"/>	Credit 4.3	Alternative Transportation, Alternative Fuel Vehicles	1
<input checked="" type="checkbox"/>	Credit 4.4	Alternative Transportation, Parking Capacity	1
<input checked="" type="checkbox"/>	Credit 5.1	Reduced Site Disturbance, Protect or Restore Open Space	1
<input checked="" type="checkbox"/>	Credit 5.2	Reduced Site Disturbance, Development Footprint	1
<input checked="" type="checkbox"/>	Credit 6.1	Stormwater Management, Rate and Quantity	1
<input checked="" type="checkbox"/>	Credit 6.2	Stormwater Management, Treatment	1
<input checked="" type="checkbox"/>	Credit 7.1	Heat Island Effect, Non-Roof	1
<input checked="" type="checkbox"/>	Credit 7.2	Heat Island Effect, Roof	1
<input checked="" type="checkbox"/>	Credit 8	Light Pollution Reduction	1

Water Efficiency

5 Possible Points

<input checked="" type="checkbox"/>	Credit 1.1	Water Efficient Landscaping, Reduce by 50%	1
<input checked="" type="checkbox"/>	Credit 1.2	Water Efficient Landscaping, No Potable Use or No Irrigation	1
<input checked="" type="checkbox"/>	Credit 2	Innovative Wastewater Technologies	1
<input checked="" type="checkbox"/>	Credit 3.1	Water Use Reduction, 20% Reduction	1
<input checked="" type="checkbox"/>	Credit 3.2	Water Use Reduction, 30% Reduction	1

Energy & Atmosphere

17 Possible Points

<input checked="" type="checkbox"/>	Prereq 1	Fundamental Building Systems Commissioning	Required
<input checked="" type="checkbox"/>	Prereq 2	Minimum Energy Performance	Required
<input checked="" type="checkbox"/>	Prereq 3	CFC Reduction in HVAC&R Equipment	Required
<input checked="" type="checkbox"/>	Credit 1	Optimize Energy Performance	1-10
<input checked="" type="checkbox"/>	Credit 2.1	Renewable Energy, 5%	1
<input checked="" type="checkbox"/>	Credit 2.2	Renewable Energy, 10%	1
<input checked="" type="checkbox"/>	Credit 2.3	Renewable Energy, 20%	1
<input checked="" type="checkbox"/>	Credit 3	Additional Commissioning	1
<input checked="" type="checkbox"/>	Credit 4	Ozone Depletion	1
<input checked="" type="checkbox"/>	Credit 5	Measurement & Verification	1
<input checked="" type="checkbox"/>	Credit 6	Green Power	1

LEED™ Rating System Version 2.1

Multiple levels



Materials & Resources

13 Possible Points

<input checked="" type="checkbox"/>	Prereq 1	Storage & Collection of Recyclables	Required
<input checked="" type="checkbox"/>	Credit 1.1	Building Reuse, Maintain 75% of Existing Shell	1
<input checked="" type="checkbox"/>	Credit 1.2	Building Reuse, Maintain 100% of Shell	1
<input checked="" type="checkbox"/>	Credit 1.3	Building Reuse, Maintain 100% Shell & 50% Non-Shell	1
<input checked="" type="checkbox"/>	Credit 2.1	Construction Waste Management, Divert 50%	1
<input checked="" type="checkbox"/>	Credit 2.2	Construction Waste Management, Divert 75%	1
<input checked="" type="checkbox"/>	Credit 3.1	Resource Reuse, Specify 5%	1
<input checked="" type="checkbox"/>	Credit 3.2	Resource Reuse, Specify 10%	1
<input checked="" type="checkbox"/>	Credit 4.1	Recycled Content, Specify 5% (p.c. + 1/2 p.i.)	1
<input checked="" type="checkbox"/>	Credit 4.2	Recycled Content, Specify 10% (p.c. + 1/2 p.i.)	1
<input checked="" type="checkbox"/>	Credit 5.1	Local/Regional Materials, 20% Manufactured Locally	1
<input checked="" type="checkbox"/>	Credit 5.2	Local/Regional Materials, of 20% in MRC5.1, 50% Harvested Locally	1
<input checked="" type="checkbox"/>	Credit 6	Rapidly Renewable Materials	1
<input checked="" type="checkbox"/>	Credit 7	Certified Wood	1

Indoor Environmental Quality

15 Possible Points

<input checked="" type="checkbox"/>	Prereq 1	Minimum IAQ Performance	Required
<input checked="" type="checkbox"/>	Prereq 2	Environmental Tobacco Smoke (ETS) Control	Required
<input checked="" type="checkbox"/>	Credit 1	Carbon Dioxide (CO ₂) Monitoring	1
<input checked="" type="checkbox"/>	Credit 2	Ventilation Effectiveness	1
<input checked="" type="checkbox"/>	Credit 3.1	Construction IAQ Management Plan, During Construction	1
<input checked="" type="checkbox"/>	Credit 3.2	Construction IAQ Management Plan, Before Occupancy	1
<input checked="" type="checkbox"/>	Credit 4.1	Low-Emitting Materials, Adhesives & Sealants	1
<input checked="" type="checkbox"/>	Credit 4.2	Low-Emitting Materials	1
<input checked="" type="checkbox"/>	Credit 4.3	Low-Emitting Materials	1
<input checked="" type="checkbox"/>	Credit 4.4	Low-Emitting Materials	1
<input checked="" type="checkbox"/>	Credit 5	Indoor Chemical & Pollutant Control	1
<input checked="" type="checkbox"/>	Credit 6.1	Controllability of Systems	1
<input checked="" type="checkbox"/>	Credit 6.2	Controllability of Systems	1
<input checked="" type="checkbox"/>	Credit 7.1	Thermal Comfort, Comfort	1
<input checked="" type="checkbox"/>	Credit 7.2	Thermal Comfort, Performance	1
<input checked="" type="checkbox"/>	Credit 8.1	Daylight & Views, Daylight	1
<input checked="" type="checkbox"/>	Credit 8.2	Daylight & Views, Views	1

Innovation & Design Process

<input checked="" type="checkbox"/>	Credit 1.1	Innovation in Design	1
<input checked="" type="checkbox"/>	Credit 1.2	Innovation in Design	1
<input checked="" type="checkbox"/>	Credit 1.3	Innovation in Design	1
<input checked="" type="checkbox"/>	Credit 1.4	Innovation in Design	1
<input checked="" type="checkbox"/>	Credit 2	LEED™ Accredited Professional	1

Project Totals

69 Possible Points

☒ Certified 26-32 points ☒ Silver 33-38 points ☒ Gold 39-51 points ☒ Platinum 52-69 points

Certified 26-32 points

Silver 33-38 points

Gold 39-51 points

Platinum 52-69 points

LEED Certified Buildings in Colorado

- Aspen Skiing Company:
 - Sundeck Restaurant
- City of Boulder:
 - North Boulder Rec. Center
- Boulder Community Hospital
 - Foothills Campus
- CH2M Hill
 - South Building
 - West Building

Incremental cost of achieving LEED

- Colorado LEED certified buildings:
0.8 to 4.6%
- 33 LEED buildings across the US:
2% average
10 to 1 benefit to cost ratio, based on 1st 20
years of building life

References: www.colorado.gov/rebuildco

www.usgbc.org/news/pdf/news477.pdf

Lesson learned

You can build better buildings within typical budgets....

But you have to go about it differently

The cost?

- Average of about 2% more, design fees
- Lower operating costs for life of building

Rebuild Colorado High Performance Design Grants

\$20,000 grants for state or local governments

- Pays for integrated design specialist to work with team:
 - facilitating integrated design meetings
 - helping you set performance targets for your new facility
 - introducing team to LEED scorecard and more
- First come, first-served basis

High performance design grants

- School district, state or local government?
- Planning a new construction project 40,000 sf or larger?
- Interested in following LEED?
- Willing to try integrated design?
- Commitment to include commissioning and energy modeling?
- Commitment at all levels?

Applying for the grant

- Download information from website
- State or local government submits letter signed by superintendent, city manager, etc.
- Questions? Email rebuildco@state.co.us

Grants for Demonstration Projects in High-Performance Design using LEED™

Rebuild Colorado, a program of the Governor's Office of Energy Management and Conservation, offers assistance to state and local governments to help design new buildings that will save year after year on utility costs, yet that are more comfortable, better lit, and affordable to build. Up to 10 grants of \$20,000 each are available for the grant recipient to hire a high-performance design specialist who will facilitate an integrated design process and oversee the LEED approach. LEED (Leadership in Energy and Environmental Design), developed by the U.S. Green Building Council, is a consensus-based national standard for designing high-performance, sustainable buildings. (See <http://www.usgbc.org/> for more information about LEED.)

Rebuild Colorado seeks projects with the following characteristics:

Scope and Timeline

- Building will be for a state agency, college or university, school district, city or county, or special district (highest priority is for state-owned facilities)
- Design will be for a new building, major addition, or large-scale renovation
- Project size is at least 40,000 square feet
- Funding is already secured for construction, or a firm plan is in place to achieve funding
- Design is in the earliest stage (pre-design stage or earlier)
- Construction is planned to begin soon after design

Commitment

- Decision-makers agree to establish LEED as a desired goal
- An internal champion is identified to coordinate the effort
- The design team is committed to using an integrated design approach and to follow LEED
- Decision-makers are willing to consider energy efficient and environmentally sensitive alternatives
- Commissioning will be incorporated as a standard part of the construction process

Potential for Success

- Likely success of applying LEED principles (LEED certification is desired, but not required)
- Strong chance of successful results (experienced design team, strong commitment)
- Owner is planning to build additional buildings that will likely incorporate the LEED process

Demonstration Potential

- First-time use of the LEED approach
- Type of building is representative of potential new buildings in Colorado
- Building will be open to the public
- Building owner is willing to publicly share project results

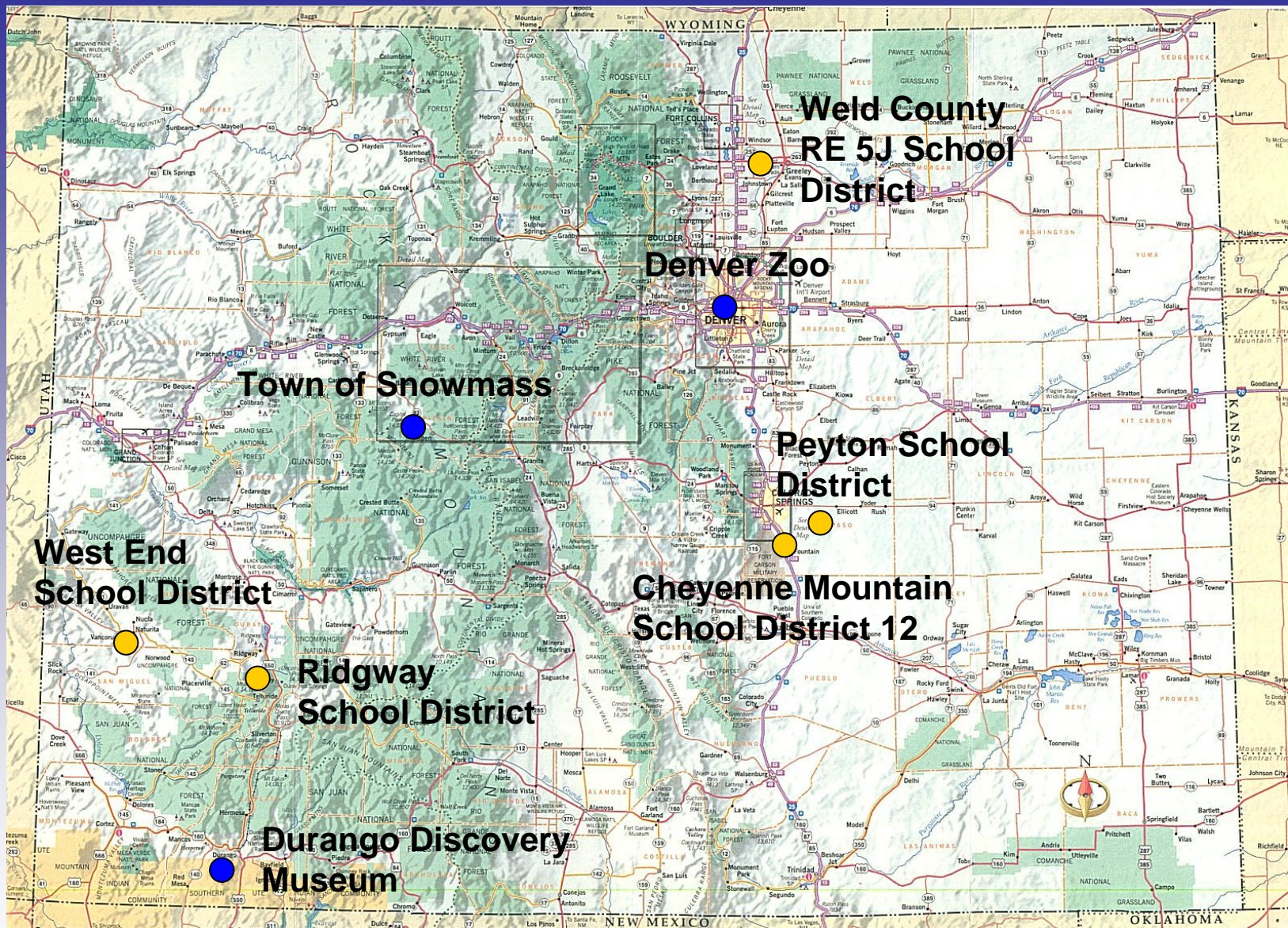
Please share your project idea with us for potential grant funding:

- Contact name, institution name, address, phone, fax, e-mail.
- Brief project overview addressing the points above
- Send via e-mail (preferred) or fax to:

Jean Gregerson, Consultant to Rebuild Colorado
Email: rebuildco@state.co.us tel/fax: 303-632-9997

Projects will be considered on a first-come, first-served basis.

225 E. 16th Ave, Suite 650, Denver CO 80201 • 303-894-2383 • 1-800-632-6662 • Fax 303-894-2385 • e-mail rebuildco@state.co.us • www.colorado.gov/rebuildco
Services are offered free for public buildings, on an as-needed, as-available basis. Rev: 08/06/03



2003-2004 High Performance Design Grant Recipients

2003-2004 Rebuild Colorado Grant Recipients

Schools:

- **Academy of Charter Schools**
- **Cheyenne Mountain School District**
- **Ridgway School District R-2**
- **West End School District**
- **Weld County RE-5J (Johnstown Milliken)**
- **Peyton School District**

2003-2004 Rebuild Colorado Grant Recipients

Others

- **Colorado Department of Labor & Employment – Office Addition**
- **Durango Discovery Museum**
- **Town of Snowmass – Town Hall**
- **Denver Zoo – Asian Tropics Exhibit**

Academy of Charter Schools

- K-12 Charter School
- Thornton
- Adams 12 District
- Groundbreaking May 2004
- LEED registered



Rebuild Colorado

***We're here to get you started...
and see you through***

Contact us!

Linda Smith, Sr. Program Manager
303-894-2383 x1203, Linda.Smith2@state.co.us

Joan Gregerson, Consultant
303-652-9997, joang@niwotcolo.com

www.colorado.gov/rebuildco

